Table 3.4-7 Heat and Material Balances – Case 6

		17 °F, 83% RH					17 °F, 83% RH					17 °F, 83% RH				
GTG Load:		100%					75%					50%				
Duct Burner Status:		Off					Off					Off				
Fogger Status:		Off					Off					Off				
Stream No	Description	Flow, kpph Per Train	Flow, kpph Plant Total	Temp. °F	Pressure psia	Enthalpy Btu/lbm	Flow, kpph Per Train	Flow, kpph Plant Total	Temp. °F	Pressure psia	Enthalpy Btu/lbm	Flow, kpph Per Train	Flow, kpph Plant Total	Temp. °F	Pressure psia	Enthalpy Btu/lbm
C1	Condensate from Condenser	—	1,115	80	273	49	—	935	80	277	48	—	807	80	279	48
C2	Condensate to HRSG Boundary Limit	606	—	85	269	54	509	—	85	273	54	438	—	85	275	54
C3	FW from LP Drum to HP/IP FW Pump	556	—	316	85	1,184	474	—	300	67	1,180	411	—	289	56	1,177
C4	HP FW Pump Discharge	472	—	319	1,612	292	414	—	303	1,459	276	363	—	292	1,302	264
C5	IP FW Pump Bleed	84	—	316	517	287	61	—	301	461	271	48	—	289	416	259
C6	Hot IP FW to Fuel Gas Preheater	49	—	431	390	409	42	—	418	334	395	35	—	405	289	381
C7	Cold IP FW from Fuel Gas Preheater	49	—	145	294	114	42	—	145	298	114	35	—	145	300	114
C8	Demin Water Makeup Into Condenser	—	19	60	30	28	—	16	60	30	28	—	14	60	30	28
G1	Gas Turbine Inlet Air	3,764	—	17	14	—	2,940	—	17	14	—	2,386	—	17	14	—
G2	Gas Turbine Exhaust	3,847	—	1,070	15	—	3,008	—	1,135	15	—	2,440	—	1,186	15	—
G3	After HRSG Duct Burners	3,847	—	1,015	15	—	3,008	—	1,059	15	—	2,440	—	1,061	15	—
G4	HRSG Stack Exit	3,847	—	197	14	—	3,008	—	180	14	—	2,440	—	168	14	—
F1	Cold Natural Gas Fuel to Plant	—	167	60	564	—	—	135	60	564	—	—	107	60	564	—
F2	Cold Natural Gas Fuel to Each GTG	83	—	60	564	—	68	—	60	564	—	54	—	60	564	—
F3	Hot Natural Gas Fuel to Gas Turbine	83	—	365	514	—	68	—	365	514	—	54	—	365	514	—
F4	Cold NG Fuel to HRSG Duct Burners	0	0	60	564	—	0	0	60	564	—	0	0	60	564	—
S1	HRSG HP Superheater Exit	423	847	1,005	1,428	1,496	372	744	1,054	1,282	1,529	328	656	1,054	1,134	1,533
S2	HRSG Hot RH Exit	503	1,006	997	343	1,524	429	858	1,044	297	1,550	373	747	1,047	259	1,553
S3	HRSG IP Superheater Exit	84	168	577	366	1,297	61	122	568	319	1,296	48	97	554	278	1,291
S4	HRSG LP Superheater Exit	42	84	571	80	1,316	28	55	562	65	1,313	20	41	549	55	1,308
S5	Cold RH to HRSG from STG	—	838	663	366	1,345	—	736	698	319	1,367	—	650	697	278	1,368
S6	Mixed RH Steam Into HRSG Reheater	503	—	648	360	1,337	429	—	680	313	1,357	373	—	679	273	1,359
S7	HP STG Throttle Steam	—	847	1,001	1,373	1,495	—	744	1,050	1,232	1,528	—	657	1,050	1,090	1,532
S8	STG HP Exhaust as Cold Reheat	—	838	663	377	1,344	—	736	698	329	1,366	—	650	697	287	1,368
S9	Hot Reheat Steam Into STG	—	1,006	995	327	1,523	—	858	1,041	283	1,549	—	747	1,045	247	1,552
S10	LP Superheated Steam Into STG	—	84	567	70	1,315	—	55	559	59	1,312	—	41	546	51	1,306
S11	STG LP Exhaust Steam to Condenser	—	1,096	80	1	1,096	—	919	80	1	1,096	—	793	80	1	1,096
W1	Not Used	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
W2	Not Used	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
W3	Not Used	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
W4	Not Used	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
W5	Not Used	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
W6	Not Used	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
W7	Not Used	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
W8	Hot Closed Loop CW	—	1,522	71	9	39	—	1,210	71	9	40	—	899	72	9	40
W9	Not Used	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Performance Summary	Per Train	Plant Total	Per Train	Plant Total	Per Train	Plant Total
CTG Heat Input, NG [1,4] mm Btu/h, LHV	1,688	6,753	1,369	5,475	1,086	4,344
HRSG Duct Burners mm Btu/h, LHV	0	0	0	0	0	0
Total Heat Consumption mm Btu/h, LHV	1,688	6,753	1,369	5,475	1,086	4,344
Gas Turbine Gross Output kW	183,600	734,400	137,700	550,800	91,800	367,200
Steam Turbine Gross Output kW	—	369,538	—	327,222	—	285,218
Gross Power Output kW	—	1,103,938	—	878,022	—	652,418
Auxiliary Power kW	—	22,773	—	20,152	—	17,875
Net Power kW	—	1,081,165	—	857,870	—	634,543
Net Plant Heat Rate Btu/kWh, LHV	—	6,246	—	6,382	—	6,846
Net Plant Heat Rate Btu/kWh, HHV	—	6,927	—	7,078	—	7,592

Notes:

1. GTG data from or implied by GE-GTG.
2. HRSG data from GTMaster.
3. STG data from GTMaster.
4. Fuel gas LHV based on 20,248 BTU/lb.
5. The above heat and material balance is an estimate. All values are subject to change pending detailed design development.